

Paper to the Society of Cosmetic Scientist

FORWARD NATURALLY

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Introduction

This paper examines a selection of natural plant materials from earliest history up until the present day and predicts the future for naturals in the year 2001.

There are a number of sources for the information, and it was the purpose of this study to attempt to correlate the most ancient of findings to present day usage. Herbalists such as Dioscorides, Gerard, Pliny the Elder, Culpepper and others, gave good personal accounts on the uses of plant material for healing. The Ebers papyrus and the many hieroglyphics found in numerous tombs gave a good insight into the medical knowledge of the ancient Egyptians. The ancient Greeks and Romans also had a wealth of written information on the healing power of herbs and plants. Ayurvedic and Chinese medicine have made a considerable contribution that is still being studied.

Europe and Great Britain also have a great deal of folk lore that has been handed down through the ages, much of it became part of the early Pharmacopoeias and survived as officinal until superceded by more modern drugs.

Finally, the author has made use of his own data base in order to draw the information into logical patterns and conclusions.

Objective

The objective of this paper, is to look at the past use of herbs and to see how they have developed through to today. To draw comparisons between cultures and continents, with particular reference to the use of the herb. Finally, on the basis of this study to predict the future of natural plant materials in the 21st century, with particular reference to the cosmetic and toiletry industry.

Findings

In Appendix I is a brief list of plants that have relevance in medical practice. These have been selected geographically, and represent a small fraction of the available materials for study.

In Appendix II is contained a typical list of plants that have been mentioned by some of the most prominent of herbal historians.

Carrots

Daucus carota

The old wives' tale known to most people, would be that the failure to eat carrots would invariably lead to being unable to see in the dark. Most children would regard this with some scepticism! It now transpires that provitamin A produces a material called visual purple in the retina and that this does, indeed, produce an improvement in night vision.

It was also quoted as being a folk lore remedy for improvement of the skin condition. It is also cited as having use in urinary tract conditions, as an antihemintic and sexual conditions.

A survey of the available literature shows considerable agreement. If one looks at the active ingredient vitamin A, then the agreement is unanimous.

In a reference from Wirkstoff CLR we read of Carrot oil which contains fat soluble active ingredients of the carrot. It is deep red and practically odourless oil. It is soluble in fats and lipoid solvents. It is a source of provitamin A which is easily decomposed in acid solutions, and should not be combined with materials such as free fatty acids (e.g. Vitamin F), it can, however, be used with fatty acid esters.

It accelerates the formation of tissue and contributes to an irreproachable skin epithelium. Preparations containing carrot oil are also suited to the care of aging skin with its tendency to cornification (and incipient wrinkling).

In the case of dry and scaly skin, carrot oil stimulates the production of sebum, but not to excess. The skin becomes soft and supple as a result. Carrot oil clears the complexion; it gradually dissolves the hardened (cornified) cores of blackheads.

The Irish Herbal (B56) tells us that *Pastinaca tenuifolia sativa* or carrot roots provoke urination and sexual desire. They are also good for jaundice and gravel.

Weiss (B46) reports that *Daucus carota* are particularly valued by paediatricians as a treatment for threadworms. It is also a source of sex hormone, the leaves of carrot contain large amounts of porphyrins, substances that stimulate the pituitary gland to release gonadotropic hormones.

Grieve (B6) has a large section devoted to carrot, which is also known as Philtron (Old Greek) and Bird's Nest. She describes much of the historical writings made on the carrot. The whole herb is collected in July; the seeds and the root. The whole herb is the part now more generally in use. It is diuretic, stimulant, deobstruent. An infusion of the herb is considered an active and valuable remedy in the treatment of dropsy, chronic kidney diseases and affections of the bladder. Considered good for gout, gravel and stone.

The seeds are carminative, stimulant and very effective in flatulent colic, hiccough, chronic coughs etc.

Old writers tell us that a poultice made from the roots has been found to mitigate the pain of cancerous ulcers, and that the leaves applied with honey, cleanse running sores and ulcers. The juice of the carrot when expressed contains crystallizable and uncrystallizable sugar, a little starch, extractive gluten, albumen, volatile oil (on which the medicinal properties of the root depend and which is fragrant, aromatic and stimulating), vegetable jelly or pectin, saline matter, malic acid and a peculiar crystallizable, ruby-red neutral principle, without odour or taste, called carotin.

The chief virtues of the carrot lie in the strong antiseptic qualities they possess, which prevent all putrescent changes within the body. Carrots were formerly of some medicinal repute as a laxative, vermifuge, poultice etc. and the seeds have been employed as a substitute for caraways. In country districts, raw carrots are still sometimes given to children for expelling worms, and the boiled roots, mashed to a pulp, are sometimes used as a cataplasm for application to ulcers and cancerous sores.

Similar properties exist for the Wild Carrot, which has the same latin name.

Ceres (B2) says that wild carrot is also known by the country name of "Bird's-nest". It is thought that carrot tea is good for digestive problems.

Huxley (B17) reports that carrot is used as the grated root and juice in face masks.

Buckmann (B15) ranks carrots with garlic and cayenne in her arsenal of good health. The vegetable is rich in vitamins A, B, and C and contains small amounts of E and K, as well as phosphorus, potassium and calcium. Carrots are used to cleanse the system of various impurities, aid many eye problems, relieve most skin problems, and help overcome many glandular disturbances. Use it every day if trying to regulate a menstrual period. If you have a problem with sinus or acne, or skin eruptions, or strange eye problems that may be nutritional, your vitamin A need may be higher than the national average. Carrots are a strong antiseptic. Can be used on raw nipples. It is a tonic. It has been used to expel worms in children.

Lust (B8) reports that it is also called the Beesnest plant, Bird's nest root, Queen Anne's Lace. The medicinal part is the cultivated root or the wild seed. It is anthelmintic, carminative, diuretic, stimulant. The soup makes an effective remedy for diarrhoea and is easily digestible. It is also useful for preventing putrefaction in the intestine and for gastro-intestinal catarrh. The carrot contains potassium, which explains the diuretic action. The juice is good for stomach acidity and heartburn.

Carrots are good for the eyes, the carotene content provides the material for the body to make vitamin A, which is important for proper vision, especially night vision.

Trattler (B12) reports that wild carrot is a diuretic.

Culpepper (B29) says that carrots are an important item in the diet of cancer patients. The wild carrot is rich in vitamins and carotene, from which the body manufactures vitamin A. An infusion of the herb is used to treat the body for fluid retention. It is used as a tea to relieve colic. The dried flowers are used as a tea as a remedy for dropsy.

Bunney (B27) says that carrots were known to the ancient Greeks and Romans as a vegetable. The practice of cultivating them was introduced into England by the Flemish refugees in Elizabethan times. Their use as a herbal remedy has a long history and they remain a popular treatment.

The fully grown fresh root is used medicinally, finely grated or the juice is strained off and used on its own. The constituents include, carotenes (provitamin A) and vitamin B complex and C, the alkaloid daucine, which has a nicotine-like odour, and sugars and pectins. Fresh carrot, particularly the carotene constituent, affects the keenness of sight and the ability to see in dim light. It has anthelmintic (anthelmintic - ACD), diuretic and stomachic properties.

For children it is effective for digestive ailments and tonsillitis. A carrot diet is said to relieve the pain in cancer patients. An infusion can be used as an anthelmintic.

Stuart (B28) reports that it contains volatile oils; carotene; B vitamins; an alkaloid daucine; vitamin C; potassium salts. The dried herb is used as a diuretic; antilithic. Specifically employed in the treatment of urinary stones; often in combination with other antilithic remedies. Weakly anthelmintic. Decoction of the seeds may be used in flatulence and stomach acidity, as may carrot juice.

Leung (B49) reports on carrot, wild carrot or Queen Anne's Lace. The carrot oil contains a-pinene,

carotol, daucol, limonene, b-bisabolene, b-elemene, cis-b-bergamotene, geraniol, geranyl acetate, caryophyllene, caryophyllene oxide, asarone, a-terpineol, terpinen-4-ol, g-decanolactone, coumarin, and b-selinene among others. [a = alpha, b = beta, g = gamma]. Other constituents present include palmitic acid, butyric acid and others.

Carrot seed oil has been reported to exhibit vasodilatory and smooth muscle relaxant activities on isolated animal organs. It also depressed cardiac action in frog and dog hearts, among other activities.

Used as a fragrance component. In certain sunscreen preparations and as a source of b-carotene and vitamin A.

In folk medicine the seeds are used as a diuretic and emmenagogue, and for flatulence in the form of a decoction or infusion. In Chinese medicine it is used to treat chronic dysentery and as an anthelmintic.

In a data sheet from Vevy (through Paroxite) we read that the root contains carotene, xanthophylls, sterols, aliphatic and terpene alcohols, tocopherols, hydrocarbons. It has been found that their excellent moisturising and emollient capacity together with good dermatrophic and dermoprotective action are closely related to the overall lipid content of carrots and is not limited to beta-carotene (8mg/100mg of the original product) which, being a liposoluble provitamin is better carried when dissolved in the natural lipidic fraction. It is mainly used in products with a moisturising emollient action having a protective function. An anti-aging action due to the effect of carotene on free radicals has also been observed.

Potter (B5) refers to *Daucus carota* as Bird's Nest or Queen Anne's Lace. The herb is used. It is diuretic, deobstruent and stimulant. An active and valuable remedy in the treatment of dropsy, retention of urine, gravel and affections of the bladder.

In a data sheet from Gattefosse we read that the root is used, which is soothing, antiseptic, healing, stimulating and tonic.

VITAMIN A RETINOL, CAROTENE

Mindell in his book (B22) says that retinol or carotene or Vitamin A is fat soluble and needs fats as well as minerals to be properly absorbed by the digestive tract. It can be stored in the body and need not be replenished every day. It occurs in two forms - preformed vitamin A called retinol (found in foods of animal origin) and provitamin A known as carotene (provided by foods of both plant and animal origin.) It is measured in :-

- USP units (United States Pharmacopoeia)
- IU units (International Units)
- RE (Retinol Equivalents)

Indications:- counteracts night blindness, weak eyesight and in the treatment of many eye disorders. It permits the formation of visual purple in the eye. It builds resistance to respiratory

infections. It shortens the duration of diseases. Keeps the outer layers of tissues and organs healthy. Helps in the removal of age spots. Promotes growth, strong bones, healthy skin, hair, teeth and gums. Helps treat acne, impetigo, boils, carbuncles, and open ulcers when applied externally. It aids in the treatment of emphysema and hyperthyroidism. Deficiency diseases:- xerophthalmia, night blindness.

Best natural sources:- Fish liver oil, liver, carrots, green and yellow vegetables, eggs, milk and dairy products, margarine and yellow fruits.

Supplements - fish liver oil (oil soluble) or acetate/palmitate derivatives (water soluble) which are particularly useful if oil intolerable, e.g. acne sufferers.

Retin A or Vitamin A acid is sometimes prescribed for acne, by prescription only 10,000 - 25,000 IU.

TOXICITY >100,000 IU DAILY if taken for many months in adults >18,500 IU DAILY in infants can produce toxic effects (one cup of cooked diced carrots = 15,000 IU)

Symptoms include hair loss, nausea, vomiting, diarrhoea, scaly skin, blurred vision, rashes, bone pain, irregular menses, fatigue, headache, and liver enlargement. Polyunsaturated fatty acid with carotene work against Vitamin A unless an antioxidant is present.

Vitamin A should not be taken with mineral oil. Vitamin A works best with B Complex, Vitamin D, Vitamin E, Calcium, Phosphorus, and Zinc. (Zinc is what is needed by the liver to get Vitamin A out of its storage deposits). Vitamin A helps prevent Vitamin C from oxidising. If taking a cholesterol-reducing drug, then may need to take a Vitamin A supplement due to reduced absorption. In order to reduce the possibility of build up in the system, it is recommended that one takes for 5 days and stops for 2. Vitamin A protects the mucous membranes of the mouth, nose, throat and lungs. It helps prevent Vitamin C from oxidising and thereby allows it to work better. If adding zinc to diet, then will need an increased amount of Vitamin A.

Chronic hypervitaminosis can occur in patients receiving megadoses as treatment for dermatological conditions. A deficiency of Vitamin A can lead to loss of Vitamin C. If zinc is added to diet, make sure that one is getting enough Vitamin A. Do not engage in strenuous exercise or physical activity within four hours of taking Vitamin A if you want optimum absorption. Antibiotics are reduced in their effectiveness when taken with supplements. Take supplements 1 hour before or 2 hours after antibiotics. Broad spectrum antibiotics should not be taken with high doses of Vitamin A. Vitamin A should not be taken with the acne drug ACCUTANE (Isotretinoin).

Winter-Griffith (B24) says that B-carotene (beta) is a pre-vitamin A compound found in plants. The body converts B-carotene into vitamin A, which is available from natural and synthetic sources and is fat soluble. The natural sources are:- fresh apricots, asparagus, broccoli, cantaloupe, sliced carrots, raw endive, kale, leaf lettuce, liver, mustard greens, pumpkin, spinach, winter squash, sweet potatoes, watermelon.

Reason to use:- aids in the treatment of eye disorders, prevention of night blindness and in the formation of visual purple in the eye. Promotes bone growth, teeth development and reproduction. Helps form and maintain healthy skin, hair, mucous membranes.

Builds body's resistance to respiratory infections. Helps treat acne, impetigo, boils, carbuncles, open ulcers, when applied externally.

Unproved speculated benefits:- controls glaucoma, buffers against cancer, guards against the effects of pollution, smog. Cushions against stress, speeds healing. Helps in the removal of age spots. Fights infections. Fights skin diseases. Shortens the duration of some illnesses.

Required by:- anyone with inadequate caloric or nutritional dietary intake or increased nutritional requirement. Pregnant or breast feeding women. Those who abuse drugs or alcohol.

Deficiency symptoms:- night blindness, lack of tear secretion, changes in eye with eventual blindness if deficiency is severe and untreated. Susceptibility to respiratory infection. Dry, rough skin. Changes in mucous membrane, weight loss, poor bone growth, weak tooth enamel, diarrhoea, slow growth. Unproved speculated benefits:- bone thickening, kidney stones, diarrhoea, birth defects, reduced production of steroid hormones.

What the vitamin does:- essential for the normal function of the retina. Combines with the red pigment of the retina (opsin) to form rhodopsin, which is necessary for light in partial darkness. May act as a co-factor in enzyme systems. Necessary for the growth of bone, testicular function, ovarian function, embryonic development, regulation of growth, differentiation of tissue.

Additional information:- The average person has 2 years store of vitamin A in the liver. Steroids are produced by the adrenal gland and are part of the natural response to stress and immune function. Failure to make these hormones leaves the immune system in less than ideal state.

Overdose or toxicity:- Bleeding from the gums or sore mouth, bulging soft spot on the head of babies, sometimes hydrocephaly, confusion or unusual excitement, diarrhoea, dizziness, double vision, headache, irritability, dry skin, hair loss, peeling skin on lips, palms and other areas, seizures, vomiting, enlarged spleen and liver. Toxicity symptoms normally appear after 6 hours from ingestion of overdose.

In the ABPI Data Sheet Compendium 1979-1980 we learn that "Ro-a-vit" (Roche) 50,000 IU retinol as the acetate, may be considered to act chiefly as the regulator of growth and activity of epithelial tissues. Plays essential role in the visual cycle through its participation in the synthesis of visual purple by the retina.

Deficiency signs:- are those affecting the eye, e.g. xerosis, swelling and destruction of the cornea and night blindness. Changes in the skin and changes in the mucous membranes of the respiratory, digestive and urinary tract have been reported.

Contra-indications during early months of pregnancy, high doses of Vitamin A should be avoided

or prescribed only where indicated by a doctor.

Marks in his book (B43) says that naturally occurring Vitamin A is only found in animals, although vegetables contain carotinoids which are precursors of Vitamin A. It is found in Nature in the esterified forms as acetate or palmitate. The various carotinoids form part of the yellow and orange pigments of most fruit and vegetables. B-carotene is in the form most easily converted into Vitamin A.

Activity:- Vitamin A is used in the eye as retinal aldehyde where it has specific action on the rod and cone vision. In many peripheral tissues Vitamin A has a more general metabolic effect, and in certain cells, particularly those of the epithelium it appears to be converted into the active retinoic acid. Peripheral effect is poorly understood - it alters the stability of the membranes of mitochondria and lysosomes.

Vitamin A is also necessary for spermatogenesis, oogenesis, placental development and embryonic growth. Vitamin A or B-carotene as a preventative against the development of cancer is a matter of dispute. Recent evidence suggests that such an activity might be present. Vitamin A has an important pathway concerned with scotopic (dim light) vision by the rods.

In an article (Editorial) of Lancet Apr30 1988, p.977 "Does topical tretinoin prevent cutaneous aging?", we read the comment that the effects of the retinoids on the skin suggests that hope of cutaneous rejuvenation may not in future be entirely vain. Several retinoids (derivatives of Vitamin A) improve various skin diseases and tretinoin (all trans- retinoic acid - a form of vitamin A found in animals) has been used topically to treat acne for 15 years. Many mature users of the commercial products (0.025% solution or 0.05% cream) notice it often causes some redness or irritation, but may make the skin look smoother and less wrinkled. Several studies support these observations. Chronic exposure to sunshine caused the skin to become dry, leathery and mottled etc. The clinical effects of the cream containing tretinoin at 0.1% showed clinical improvement. The greatest change occurred in the fine wrinkles. The levels and safety data have still to be assessed.

In a paper in the Lancet 1988;24/31 Dec:p.1502-3. Dept. of Dermatology, Leeds General Infirmary. Acne caused by localised Vitamin A deficiency? The authors put forward the theory that since acne is associated with over-production of sebum, and since a high sebum flow has been associated with a local shortage of Vitamin A, perhaps this is the central feature which determines whether excessive sebum will be produced, and subsequently lead to blocked hair follicles, inflammation, and the end result which every teenager knows only too well. They refute bacterial contamination as the cause.

Harry in his book (B52) says that Vitamin A is known as the anti-infective vitamin, biosterol, ophthalmia. Vitamin A is a fat soluble anti-infective vitamin occurring in animal organisms but not plants. It is found most abundantly in fish liver oils in which it occurs in ester form, derived from carotinoids. It has also been prepared synthetically.

The relationship of an adequate Vitamin A intake to proper keratinisation of the skin appears fairly well proven. Hyperkeratosis involving deposition of keratinous material in the hair follicle has

been proved to be symptomatic of a Vitamin A deficiency in laboratory animals and there is evidence to show that this applies to man.

Lehman and Rappaport concluded that Vitamin A vitaminosis is much more common than is supposed and that various skin lesions classified under hyperkeratosis are inextricably associated with less than the optimum requirement of vitamin A.

O'Leary in a summary of the literature, has pointed out that in certain skin diseases the response to the administration of Vitamin A is so rapid and clear cut that the deduction is warranted that the result is "specific". These diseases include phrynoderma (toadskin), a papular dry skin infection; pityriasis rubra pilaris, a disease of the skin characterised by the formation of hard elevations around each hair follicle; keratosis follicularis, a papular disease characterised by cornification of the epithelial layers of the skin. It is true that these diseases in many cases are due to a certain deficiency, and that the administration of the missing deficiency would be expected to cure them. Nevertheless, their connection with the skin and the type of the eruption suggests that milder forms of nutritional deficiencies could produce changes in the skin and this possibility must be borne in mind.

The close connection between the skin and Vitamin A is shown by the fact that changes in the skin occur before changes in the eye.

It appears that blackheads are common in such conditions, though apart from the face this is not usually involved, the nails may be ridged and the hair may be dry. In general, however, the hair and nails are normal. In laboratory animals Vitamin A will reduce hair growth, though this is not true in man. The application of vitamin A does not cause a thickening of the epidermis as it does in animals.

It is evident from radiochemical and other investigations that vitamin A penetrates the skin in small amounts, but it is suggested that penetration is so slow that only a fraction of that applied topically to human subjects reaches the granular and Malpighian layer where any faulty keratinisation might be corrected.

In The section Technically speaking by C. Fox Cosmetics and Toiletries, 105, April 1990 we read that an article by D.F.Counts et al. on the effect of retinyl palmitate on skin composition and morphology [J.Soc. Cosmet. Chem 39(4),:235-240 1988] that increasing topical doses of retinyl palmitate ranging from 0.1 - 5% for 14 days in a suitable cosmetic vehicle, caused significant dose related changes in skin composition of the hairless mouse.

There was a maximum 32% increase of protein per unit of skin surface area and a maximum of

128 collagen per unit of skin surface area in response to the vehicle containing retinyl palmitate when compared to the control vehicle. In addition there was an increase in DNA content, as well as a significant thickening of the epidermis.

In a data sheet from Wirkstoff CLR we read that vitamin A or its provitamin A, carotene, is indispensable to the body. With vitamin A deficiency severe functional disturbances arise which manifest themselves dermatologically - and hence cosmetically - as increased keratinisation, excessive dehydration, stronger pigmentation, wrinkling and desquamation, together with malfunctioning of the sebaceous and sweat glands.

External application of vitamin A increases the mitosis activity of the skin and accelerates the formation of new tissue. It protects the external layers of the skin and militates against cornification and also by hyperkeratosis of the hair follicles. It stimulates the production of sebum and perspiration, but not excessively so. The skin is thereby protected against flaking and the hair from brittleness.

Provitamin A is converted into vitamin A in the liver and intestine, and therefore exhibits the same biological effects as vitamin A. The fact that provitamin A is likewise transformed into vitamin A in the cells of the sebaceous glands of the skin is of importance for its cosmetic applications, since a known vitamin A deficiency can thus also be remedied by the percutaneous administration of preparations containing carotene.

Anon. Treating sun damaged skin with tretinoin. Pharm J 1990, 244, 697. Vitamin A derivative more than cosmetic. Prof. John Voorhee, University of Michigan medical centre, reported at a dermatology conference in London (22-25 May 1990) that license applications are being made in the USA and the UK for the use of tretinoin (Vitamin A derivative) for the treatment of sun damaged skin. Although tretinoin can reduce fine wrinkles and reduce sun-induced pigmentation, at high doses it appears to be useful in the treatment of a pre-malignant skin condition which can develop into squamous cell skin cancer.

In the Roche "Vitascope" Vol.#2, issue no.1 Fall 1990 we read that vitamin A palmitate has the following topical benefits:- penetrates into the skin, anti-keratinising, increases skin elasticity, helps dry parched skin regain its normal, healthy look, helps make skin soft and supple, is ideal for use in skin care and after sun care products.

It is often referred to as the "normalising vitamin" because it is essential not only for the normal skin development, but also for the growth and maintenance of bones, teeth, glands, nails and hair.

Over the last four years, the vitamin A group has received additional publicity because of the clinical studies conducted with one of its analogues, retinoic acid, which have shown that this ingredient is capable of reversing photoaging. These studies have demonstrated that daily facial application of creams containing retinoic acid (Retin-A) can produce improvement in reducing fine wrinkling and overall skin colouration.

Retinyl palmitate on the other hand, which also belongs to the vitamin A group, is used as a cosmetic ingredient and, as such, is safe for use in facial creams and lotions.

Changes in skin elasticity occur in skin as a result of using vitamin A palmitate. There was hardly any change in the skin elasticity at 5,000 IU/gm for 15 days, this is less than 3%, but that the elasticity was altered significantly at 10,000 IU/gm. Thus elasticity of skin was increased by 14% compared to the base line. Increasing time studies are continuing.

R.Marks (B41). R.Marks: Acne - Advice on clearing your skin. 1984. Dunitz ISBN 0-906348-53-6 (-52-8 in paperback) we read that some lotions and gels contain retinoids, that is, compounds derived from vitamin A, are used in the treatment of acne. They work by loosening the blackheads and making them pop out. The most effective treatment is retinoic acid, used at a concentration of 0.025% in a gel and 0.05% in a cream.

It can make people's skin quite sore after a few days, the treated area becomes pink and slightly dry and scaly.

In this first example we have seen how, from an old wives' tale, the significance of the vitamin A in carrot has been proven. It provides both improved night vision, and skin benefits, whether used as provitamin A (beta-carotene) or as vitamin A.

The next extract to be considered shows the agreement across cultures and continents of a widely available plant. It was known to the ancient Syrians, Egyptians, Arabians, Indians, Greeks, Romans and the Chinese to name but a few. The various areas of usage are quite varied, but the overall consensus shows the properties to be remarkably similar.

FENUGREEK or METHI

Trigonella foenum-graeceum

In a reference from Folicon (through CPL Fragrances) we learn that it is a part of Ayurvedic medicine. It contains alkaloids - trigonelline, choline, nicotinic acid, saponin, promolin, essential oil. Dermatologically it offers complete skin and mucous membrane compatibility.

In Sanskrit it is also known as Methika. The seeds, pods and leaves are used. Methi is an aperient, aphrodisiac, astringent, carminative, cooling, demulcent, diuretic, emollient and suppurative. Methi is useful in chronic cough, diarrhoea, dysentery and dyspepsia, dropsy, enlargement of the spleen and liver, flatulence, inflammatory affections, leucorrhoea, small pox, swellings, and to prevent hair falling out.

The chief uses of Methi are hair care, cleansing the skin, its toning and stimulation, checks hair

loss, stimulates hair growth and darkens them, useful for facial and skin care.

Fluck (B2) reports that fenugreek or Foenugreek contains mucilage, aromatic principle, abundant organically combined iron and phosphorus. Internally the drug stimulates gastric secretion and aids digestion. The supposed expectorant action is not confirmed. Externally the seeds are emollient and accelerate the healing of suppurations and inflammations.

Externally cooked with water into a porridge and used as hot compresses on boils and abscesses in a similar manner to the usage of linseed.

Ceres (B1) refer to the fenugreek as Bird's Foot, Classical Greek Clover, Greek Hay-seed. It is a natural fertiliser used by farmers. Fenugreek is rich in minerals and could be useful as a human food as well as an animal food. It is supposed to stimulate the appetite, to provide a soothing and quietening drink.

The soaked seeds are useful as an external poulticing lotion which can be used for inflammations such as boils and abscesses.

Potter says (B5) that the herb is found in N.Africa and India. the seeds are used. It is emollient. Used externally as a poultice in abscesses, boils, carbuncles etc. Internally a decoction is used in inflamed conditions of stomach and intestines. It is an ingredient in curry powders.

Grieve (B6) says that it contains about 28% mucilage; 5% of a stronger smelling, bitter fixed oil; 22% proteids; a volatile oil; two alkaloids trigonelline and choline; and a yellow colouring substance. The chemical composition resembles that of cod liver oil, as it is rich in phosphates, lecithin and nucleo-albumin, containing also considerable quantities of iron in an organic form which can be readily absorbed.

Reutter has observed the presence of trimethylamine, neurin and betain; like the alkaloids in cod liver oil, these substances stimulate the appetite by their action on the nervous system, or produce a diuretic effect.

In Cairo it is used under the name Helba. Said to be equal to quinine in preventing fevers; is comforting to the stomach and has been utilised for diabetes. Employed in the preparation of emollient, cataplasms, ointments and plasters.

They give a strong mucilage, which is emollient and a decoction is used internally for inflamed conditions of the stomach and intestines. Externally it is used as a poultice for abscesses, boils and carbuncles etc. It can be employed as a substitute for cod liver oil in scrofula, rickets, anaemia, debility following infectious diseases. Also used to give a maple flavour to confectionery and used in curry powders. It has a powerful odour of coumarin. In India the plant is used as an esculent

(?).

Schauenberg and Paris (B60) say that the seeds contain 30% mucilage (galactomannanes), a steroidal saponin, choline, a volatile oil with a strong smell of goats, a fatty oil and 27% proteins. Trigonelline (a derivative of nicotinic acid) can be converted to nicotinamide (Vitamin PP). The pulverised seeds are used in poultices to treat boils, cellulitis and some inflammations of the ganglia. For internal use, fenugreek is administered in strong doses as a tonic in cases of scrofula, tuberculosis and osteomyelitis. Traditionally used to treat catarrh, and sometimes as an aphrodisiac. It is sometimes used to restore blood sugar balance. Historically, it is one of the oldest known medicinal plants. Hippocrates thought highly of it. The plant was introduced into central Europe at the start of the 9th century.

Lust (B8) says that it is expectorant, mucilaginous, restorative. Fenugreek is one of oldest medicinal plants, dating back to the ancient Egyptians and Hippocrates. Large amounts of the decoction are given to strengthen those suffering from tuberculosis or recovering from an illness. It can also be taken for bronchitis or fevers and gargled for sore throat.

Fenugreek is sometimes considered as an aphrodisiac. Make a poultice for gouty pains, neuralgia, sciatica, swollen glands, wounds, furuncles, fistulas, tumours, sores and skin irritations.

Level in her Elixirs of Life (B10) says that in one of the great processions that took place at Daphne under Antiochus Epiphanes, king of Syria, all those who entered the gymnasium to witness the games were anointed with perfumes from golden dishes which contained fenugreek, cinnamon, spikenard, saffron, amaracus and lilies.

The seeds are used. Fenugreek is eaten as a salad in India, it is cultivated as a fodder plant, and is said to be the Hedysarum of Theophrastus and Dioscorides. It contains a large amount of mucilage.

The name for the plant in Egypt is Helba. It is considered aphrodisiac, carminative, demulcent, nutritive and tonic.

In the Extracts from Nature book (B47) we read that aromatic fenugreek is native to the Mediterranean and commonly known as Greek Hay-seed. One of the oldest medicinal plants, it is used to treat neuralgia, sciatica, gout, tumours, is an aphrodisiac and calms inflamed stomach and intestines. Used externally it also soothes inflammation.

Bunney (B27) says that it is native to the Mediterranean, but has been widely cultivated since ancient times. The plant may become increasingly important as a source of steroid precursor that could be used in sex hormone preparations.

The seeds are used medicinally. They are rich in proteins and mucilage; they also contain the nontoxic alkaloid trigonelline, choline, fatty oil, steroidal saponins (mainly diosgenin and yanogenin) and traces of an essential oil. The seeds have tonic, stomachic, demulcent, carminative, hypoglycaemic and galactagogic properties. As a coarsely ground powder, the seeds make a convalescent drink. They also stimulate digestion, increase milk flow and ease coughing.

Externally the crushed seeds are used to make hot mushy plasters and applied to bruises, swellings, boils and ulcers. In veterinary medicine too, the seeds are used to increase milk production.

Fenugreek is used as a spice in the Middle Eastern and Indian peoples, and as a coffee substitute.

Weiss (B46) says that the seeds are often used in emollient cataplasms, to soften boils. They also contain mucilage and a fixed oil, plus the alkaloid trigonelline. The seeds are prepared just like linseed, boiling them in water to make a thick mass which is then applied to a piece of linen or the like.

Leung (B49) gives a full account of the composition, trigonelline, choline, gentianine, carpaine, saponins, diosgenin, yamogenin, tigogenin, neotigogenin, flavonoids, vitexin, vitexin-7-glucoside, orienting arabinoside, mucilage, protein, free amino acids, vitamins A, B1 and C, minerals calcium and iron. Aqueous and alcoholic extract have been reported to have a stimulating effect on the isolated guinea pig uterus, especially during the last period of pregnancy, indicating that these extracts may have a highly oxytocic activity. There is also a reported hypoglycaemic effect in animals. A recent report has indicated that fenugreek absolute is nonirritating, nonsensitising and nonphototoxic to human skin.

Used as an ingredient of curry powder and as a spice. Its major use in the USA is in imitation maple syrups.

In Folk medicine, it has been used for millennia as a drug and a food or spice in Egypt, India and the Middle East. Its medicinal use include fever reducing and treating mouth ulcers, bronchitis, chronic cough and chapped lips, for milk production, as a digestive aid, for cancers and others. It is also reported in Java in hair tonics and to cure baldness.

Fenugreek was first introduced into Chinese medicine in the Sung dynasty (1057 AD) and has since been used as a nutrient and in treating kidney ailments, beriberi, hernia, impotence, and other male problems. Used in the production of steroid hormones and related drugs.

Culpepper (B29) says that it is one of the oldest medicinal plants and is still used in herbal practice. Fenugreek tea made from the seeds is used as a gargle for sore throat and for fevers. The drink is mucilaginous, nutritious and soothing to the intestinal canal. Poultices are made from the

powdered seeds to which powdered charcoal can be added. They are effective for wounds, ulcers and boils.

Stuart (B28) says that the Benedictine monks introduced the plant to central Europe and Charlemagne promoted it in the 16th century. It was grown in England in the 16th century. The herb has long been a favourite of the Arabs and it was studied at the School of Salerno by Arab physicians. Egyptians not only used the seeds for medicinal purposes, but roast them as a coffee and ate the sprouting seeds as a vegetable. Indians also use the leaves as a vegetable, and use the seeds as a spice and dyestuff. It contains mucilage (up to 30%); trigonelline; choline; flavone pigment; fixed oil; protein (to 20%); lecithin; phytosterols.

It is aromatic; carminative; tonic; the seeds are valuable in dyspepsia and diarrhoea. Used as a spice, roasted as a coffee substitute. An ingredient of commercial chutneys and the Middle Eastern confectionery Halva. Seeds provide a yellow dye.

In the Irish Herbal (B56) we read that it causes abscesses, boils and all kinds of tumours to suppurate.

Manniche (B59) says that the plant is a member of the pea family. The seeds are rich in vitamins, nitrates and calcium, properties which may have influenced a prescription for rejuvenation of pharaonic date. The seeds are thought to encourage lactation and heal inflammations. They are a frequent ingredient in curry spice and are in Egypt added to bread. Among the classical authors Theophrastus mentions fenugreek, calling it an Indian plant. Dioscorides says that the Egyptians called it "itasin". Fenugreek seeds were found in the tomb of Tutankhamun. In ancient Egypt the herb was used to induce childbirth. It was also used as a vaginal suppository for the same purpose. Dioscorides also describes a concoction of the seeds to treat the vulva. Furthermore, fenugreek was made into an ointment which must have been in great demand. A translation of text is included in the book which describes in detail the method of producing the unguent. It concludes "...It is a remedy for illness in the head. When the body is rubbed with it, the skin is left beautiful without any blemishes. It is a million times efficient". Prospero Alpini mentions fenugreek as an ingredient of pain killing mixture and a poultice to treat fever. It was considered a 'warming herb' and poor people used it to gain weight.

The British Herbal Pharmacopoeia (B26) says that it is demulcent, mucilaginous, laxative, nutritive, expectorant and orexigenic. It is used topically as an emollient and vulnerary. It is

indicated for dyspepsia, anorexia, gastritis and convalescence. Topically for furunculosis, myalgia, gout, wounds, crural ulcer.

Mills (B65) reports that it has steroidal saponin (diosgenin), alkaloid (trigonelline), bitter principle, mucilage, volatile oil. It is nutritive and digestive tonic, galactagogue, hypoglycaemic, locally demulcent, healing and anti-inflammatory. It is used for poor digestion and where nutrition is poor, for gastric inflammation, to promote lactation, locally for skin inflammations and infections.

Howard (B67) says that it is also known as Greek Hay. It is an annual with pink flowers. Originally it was grown in the ancient world as an animal feedstuff, hence the name Greek Hay or *foenum-graecum*. It is believed that the herb was introduced into medieval Europe by the Benedictine order of monks, but it is not mentioned in any herbal until the 16th century in English.

Fenugreek was used by the famous Arab physicians, but the Egyptians and Hindus cultivated it for food. In the Middle Ages it is recorded that fenugreek was added to inferior hay because of its pleasant smell. 17th century apothecaries recommended that after giving birth women should sit over the fumes of a decoction of this herb, with their legs open, to help expel the placenta. It is emollient, vulnerary, tonic, expectorant and demulcent.

It has always been renowned for expelling poisons and unwanted waste materials from the human body. It can also be used as a cure for bronchitis, a gargle for sore throats and a general tonic. Externally, it is recommended for treating wounds, sores and boils.

Thus we see, that the data from many civilisations and cultures can knit like a patchwork quilt into a fascinating pastiche that corroborates and substantiates all the findings.

The future

The future is not that difficult to envisage, the need for claim substantiation is going to force the industry to seek out the real benefits of extracts from the suppliers of those materials. Herbalists will be in demand for their knowledge, as will the homoeopaths and aromatherapists. The addition of minute quantities of plant material will no longer be acceptable, as a means to making product claims.

The lead in natural materials will come from Europe, where the use of natural remedies is already part of the culture, and accounts for at least one half of the medicines prescribed.

The decision made by many Universities to move away from pharmacognacy, is a folly that will leave this country without pioneers in a vital and much needed area of cosmetic and medical science. It will be left to a dedicated few to gather and store the information for future generations, so that they can evaluate the benefits and isolate the actives.

Consider some of the superb ideas that have been discovered recently.

Antiseptic and natural preservative

Neem, Nimba or Margosa Azadirachta indica

In a reference from Folicon (through CPL Fragrances) we learn that it is a part of Ayurvedic medicine. It contains alkaloids - nimbin, margosine, nimbinin, nimbidin. Dermatologically it offers complete skin and mucous membrane compatibility.

It is also known by the Sanskrit name Nimba. Every part of the plant is used:- bark, root-bark, young fruit, nut or seed, flowers, leaves, gum and toddy or sap.

Neem is alterative, antihelmintic (anthelmintic in text), antiarthritis, antimalarial, antiperiodic, antiseptic, appetiser, astringent, bitter tonic, constipative, cooling, demulcent, digestive, emmenagogue, emollient, expectorant, febrifuge, flatulent, ophthalmic, purgative, stimulant, stomachic, tonic and vermifuge.

Neem is indicated in boils, bronchitis, catarrhal affections, diabetes, debility, eczema, eye trouble, fever, glandular swelling, indigestion, jaundice, leprosy, liver complaints, lumbago, malaria, night-blindness, piles, prurigo, purgative, pustular eruptions, rheumatism, scrofula, skin diseases, ulcers, urinary diseases, urticaria, vomiting in fevers and worms.

Neem is commonly used as tooth brushes for cleaning the teeth and mouth and to prevent pyorrhoea; skin diseases, vermicide, softens hard and rough skin, skin antiseptic, allergy, hair care, checks hair loss, stimulates hair growth and darkens them. (for dark hair).

In a data sheet from Midland Biocides we read that Midecol CF is a naturally occurring oil with pronounced antimicrobial properties, extracted from the seeds of a tropical tree, **Azadirachta indica**. Its widespread use over many years in native medicine gives indication that its safety to humans is much greater than almost any synthetic biocide, even though its antimicrobial activity is similar to that of many commonly used industrial biocides. Toxicological studies have verified this initial impression, allowing Midecol to be presented as a broad-spectrum antimicrobial agent suitable for use in a wide range of applications from personal care products (subject to appropriate registration) to industrial systems.

It has shown exceptionally low toxicity and appears to be almost completely non-irritant. Usage in personal care products is recommended at between 0.1 - 0.5%.

The document then goes on to give the minimum inhibition concentrations for various yeast, bacteria and fungi. The report continues by giving some preservative challenge test results, and shows that at 1% it will satisfy the BP criteria for topicals. At 0.1% it has a kill value, but not sufficient to satisfy the stringent criteria of the BP code. It does this for a range of typical products.

The material is a complex mixture of limonoids, tetranortriterpenoids and fatty acids. The exact mode of action has not been determined for its action, as many different mechanisms may be involved. More than 50 different components have been identified and isolated. Nimbin (0.19%), Nimbinin (1.0%), Salannin (0.945%), Azadiradione (0.8%), 17-epi-Azadiradione (0.0267%), 7-deacetylazadiradione 7-benzoate (0.0389%), epoxyazadiradione 7-benzoate (0.0667%), gedunin 7-benzoate (0.0833%), meldenin (0.0005), 1,3-diacetylvilasinin (0.0255%), 17beta-hydroxyazadiradione (0.194%), 1alpha-methoxy-1,2-dihydroepoxyazadiradione (0.0167%), 1beta,2beta-diepoxyazadiradione (0.0167%), 7-acetylneotrichelenone (0.0389%), 3-deacetylsalannin (0.04%), salannol (0.005%), salannolide (0.008%), nimbinene, 6-deacetylnimbinene, nimbandiol, 6-O-acetylnimbandiol.

It does not take much thought to consider how many other natural preservatives that may exist, which have less toxic or less skin irritating effects than many of the current synthetic materials which are available. It is also important to remember that in many cases, these complex mixtures not only have the active ingredient but also in many cases have a built in desensitiser or counter-irritant material.

Natural skin healing agents

As a result of modern disaster and often because of the poverty of the people involved, there have been occasions when the old traditional medicine has been used as the treatment.

MIMOSA

Mimosa tenuiflora

In a data sheet from the ETS Schmitt-Jourdan (Arnaud Group) via K&K Greeff we read that this species of mimosa is known as the skin tree or Tepezcohuite or Mimosa tenuiflora. The Tepezcohuite powder is obtained by fine grinding of the bark of the tree which is found growing on a reduced area of the State of Chiapas (Mexico). The Tepezcohuite powder is a popular medicine in Mexico, but the exportation is controlled by the Health Authorities and the Ministry of Agriculture.

The traditions inherited from the famous Mayas, refer to the magical effects of the Tepezcohuite in curing humans and animals. Two dramatic events brought to light the therapeutic properties.

The explosion in Mexico of the National Petroleum Company PEMEX gas plant, where more than 500 were killed and several hundreds were horribly burnt 19.11.1984

The earthquake which destroyed the old Aztec chief town in the south of the country with several ten thousands of victims (Spring 1985) In both cases the Mexican Red Cross Manager Dr. Mario Doria, at the Tlanephana Hospital ordered the use of Tepezcohuite powder to cure the badly burned by simple plastering.

The stupefying results have been seen by numerous journalists, doctors or scientists from many countries; an analgesic effect in less than three hours and complete reconstitution of the epidermis within 3-5 weeks. Repigmentation within 3 months. More than 6000 testimonies have been gathered from which 3000 for the Tlanephana Hospital during a period of 3 years.

Statistically it is considered that 20% of the badly burnt do not survive in spite of the modern treatments. The Mexican Red Cross claims that this proportion did fall down to 4% with the use of Tepezcohuite. The product is currently being researched at the Health Ministry, Ottawa University etc.

It is usually admitted that Tepezcohuite bark contains a strong analgesic, several antibiotics (strong antiseptic effect), tannins, lactones, flavonoids, saponins, numerous oligo-elements.

In a letter dated 13.12 1989 to Mr. A.C.Dweck we read that Mr. Blech informs the author that the Tepezcohuite has bacteriostatic, and healing properties and has proved useful in inhibiting the activity of Hyaluronidase, a depolymerising enzyme of hyaluronic acid. Its history could be traced back to the Mayan civilisation when its regenerating properties on human tissue was greatly valued. The rediscovery of this natural remedy in treating severe burns has attracted the interest of both pharmaceutical and cosmetic formulators.

In a data sheet from Schmitt- Jourdan we read that a 5% glycolic solution has a number of properties. The regenerative effect of Tepezcohuite on living tissue was well known by the mysterious Maya civilisation. The spectacular results recently obtained have caused the rediscovery of this ancient folk remedy, and attracted the interest of research departments of various laboratories. This product, in a form directly usable in cosmetic formulations, has been tested for efficacy according to the requirements of cosmetic legislation. The complete file on this product was attached. It was recommended for products with cutaneous regeneration activity, sun or after-sun protection products (healing, repairing and re-equilibrating properties). Products relating to bioflavonoid activity in general (increase in capillary resistance, improvement in peripheral microcirculation). Dermatological applications...acne gels etc.

In a further data sheet from Schmitt-Jourdan we read that Tepezcohuite is a glycolic extract obtained from *Mimosa tenuiflora* bark powder. This tree from the Mexican southeast (Cintalapa Valley in the state of Chiapas) otherwise known as Tepezcohuite or the "Skin Tree" has been used in Mexican Folk remedies since before the Spanish conquest. The mysterious Maya civilisation were already familiar with the regenerative virtues of the ground bark on living tissue.

The press has extensively reported on the renewed interest of several laboratories following the disasters listed previously.

The product contains tannin at 130mg per 100g. The bioflavonoid content was 1.0-1.2 mg per ml. The product was non-irritant to primary cutaneous irritation and showed very slight ocular irritation.

Bioflavonoids are the vitamin P protectors in capillary permeability. In plant bark one generally finds the flavonoids; rutoside, quercetol, rhamnetol and esculoside. These four products are best known for increasing capillary resistance.

Numerous works recently done on the properties of bioflavonoids have shown varied activity on skin aging. (Anti free radical activity, inhibitor activity on degradation enzymes of connective tissue proteins such as collagenase, elastase, hyaluronidase).

Mimosa tenuiflora protects the integrity of Hyaluronic acid by inhibiting hyaluronidase.

The bacteriostatic activity was conducted by the Pharmacy department of Paris Sud, Microbiology and Immunology Faculty under Prof. J. Fourniat, who has illustrated the bacteriostatic activity of *Mimosa tenuiflora* powder. The cultures studied were intentionally chosen from those found in acne lesions (*Staphylococcus aureus*, *Staphylococcus epidermidis* and *Propionibacterium acnes*) The healing properties were demonstrated on the skin of 150 guinea pigs using a test which demonstrated the stimulating effect on mitotic potential in Guinea pig nipple cells.

A study from Biogir S.A. ref 88.606 dated August 1988 performed the comparative evaluation of the mitotic index in the guinea pig.

In a further study the results were given for the experimental evaluation of *Mimosa tenuiflora* part I: screening of its antimicrobial properties. Lozoya and Navarro (Biomedical Research unit in Traditional Medicine and Drug Development. Mexican Institute of Social Security. Xochitepec, Mor. Mexico). Arnasan and Kourany. Faculty of Science University of Ottawa. Canada. The study concluded that in vitro a strong inhibition growth effect was observed in all the gram positive and gram negative organisms, yeasts and dermatophytes used. The paper mentions the cicatrising effect of the powdered bark on burns. The following cultures were examined:-
Escherichia coli, *Klebsiella pneumonia*, *Micrococcus luteus*,
Pseudomonas aeruginosa, *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Proteus vulgaris*,
Acinetobacter calcoaceticus,
Bacillus subtilis, *Candida albicans*.

Grieve (B6) reports that *Mimosa fragifolia* is an acrid astringent, that *Mimosa linguis* is a diuretic astringent and that *M. humilis* the Brazilian Mimosa or Sensitive plant (because the leaves close at the slightest touch) is used as a tincture of the leaves by homoeopaths for swelling of the ankles.

In the Extract from Nature Book (B47) we read that Mimosa is a type of Acacia, with pretty pastel flowers. It is common as a fragrance note and is traditionally used by homoeopaths to treat swelling of the ankles, due to its diuretic and astringent action.

In *Cosmetics & Toiletries*, August 1990, we read of the regenerating properties of mimosa making possible the reconstruction of drawn epidermis.

ALOE VERA

Aloe vera

In the Lawrence review of Natural Products we read that drawings of aloe have been found in the wall carvings of Egyptian temples erected in the fourth millennium B.C. Called the plant of immortality it was a traditional funerary gift for the Pharaohs. The Egyptian Book of Remedies (ca. 1500 B.C.) notes the use of aloe in curing infections, treating the skin, and preparing drugs that were chiefly used as laxatives. It is said that (John 19:39-40) Nicodemus brought a mixture of myrrh and aloes to prepare Christ's body. Alexander is said to have conquered the island of Socotra to obtain control of it. The Greek physician Dioscorides in 74 A.D. recorded its use to heal wounds, stop hair loss, treat genital ulcers, and eliminate haemorrhoids. Its clinical use began in 1930s as a treatment for roentgen dermatitis. Most common use of the gel is to treat minor burns and skin irritation. Early reports described the use of aloe for radiation induced dermatitis. The review also states that one

author claimed that aloe stimulated tissue granulation and wound healing. The activity of aloe in treating burns may stem from its moisturising effect, which prevents air from drying the wound. Current theory is that the healing is stimulated by the mucopolysaccharides in combination with sulphur derivatives.

In a paper by t'Hart, L.A. van Enckevort, P.H. van Dijk: *J.Ethnopharmacol.* 1988;p.61-71. Faculty of Pharmacy, State University of Utrecht, The Netherlands, it is said that the mucilagenous gel obtained from the leaves of the aloe vera plant has long been used for its healing and cosmetic properties. The paper attempts to probe the healing components of the plant. The authors concluded that the aloe plant contains two fractions, each containing a substance or substances which can significantly affect human immune responses, and that further work is required to isolate and identify them.

In a paper by Rodrigues-Bigas: *Plastic and reconstructive Surgery* 81(3)p.386 1988. we learn that aloe has been ascribed medicinal properties since early times. Recent reports suggest it is an effective antibacteriacidal, and this and the other benefit that it is an inhibitor of thromboxane production, could make it advantageous for the management of burn wounds. They go on to discuss the mechanism of the process and conclude that the aloe vera gel extract permits a faster healing of burn wounds.

In a data sheet from Vera Products Inc. (via agents Honeywill & Stein) we read that aloe vera is known as the "burn plant" or the "medicine plant". The inner portion of the leaf contains a virtually tasteless hydrocolloid which is composed of polyhexanoses and hexans such as xylose arabinose and galactose.

Proteolytic enzymes, biogenic stimulators, saponins, hormones, proteins, vitamins, amino acids, phosphorus, iron, magnesium, silicon, zinc, copper and phosphatide esters have also been found in the gel. By far the vast majority of compounds in the hydrocolloid are the polysaccharides. It is the polysaccharides that give aloe its moisturising and rejuvenating properties.

Aloe vera has been used by the Egyptians, Romans, Italians, Greeks, Arabians and the Chinese for centuries. Cleopatra attributed her beauty to the use of the aloe vera gel. Thirty five hundred years ago the medicinal virtues of aloe vera gel were noted in the Papyrus Ebers. Discorides recorded applications of the gel for over 2000 years. These applications included wounds, stomach disorders, constipation, itching, loss of hair, blistering, skin care, blemishes and sunburn amongst others. Alexander the Great was persuaded by Aristotle to conquer the

island of Socotra for the purpose of obtaining sufficient amounts of aloe for use in healing his

soldiers wounds. John 19:39 of the New Testament tells of Nicodemus coming by night and bringing a mixture of aloe and myrrh to embalm the body of Jesus. The Chinese use aloe vera gel for stomach ailments and treatment of rashes and other skin disorders. Seminole Indians used aloe vera gel during surgery where it was applied to the incision to hasten healing.

The reference continues with a list of referenced claims for aloe vera which include treatment of thermal and radiation burns, oral and skin ulcers, acne, poison ivy and other skin ailments. It is also active against a number of bacteria, which are listed in the reference. This shows that aloe vera not only promotes healing but also has been shown to inhibit the growth of infectious bacteria. Regular application of aloe vera will reduce the amount of scar tissue. The paper lists many other reported cases of healing.

In a data sheet from Active Organics it is reported that it is a holy plant, and has been used as a healing salve

In a data sheet from Cosmetochem we learn that it used for skin creams and lotions, particularly for older and sensitive skin. It is also very useful for skin moisturising.

Stuart in his book (B28) says that the fresh juice is used to heal burns.

Lust (B8) reports that aloe is an emollient, purgative, vulnerary. It is recommended for sunburn, minor burns, wrinkles, insect bites, skin irritations, minor cuts and scratches. The fresh juice is also said to help heal wounds by preventing or helping to draw out the infection. Atea from the juice makes a good wash for wounds and for the eyes.

Grieve (B6) has a comprehensive section in her book on aloe, where she points out that the two important constituents of aloe are the two aloins, barbaloin and isobarbaloin. She also makes reference to the historical details of aloe. The production was known to the Greeks from the island of Socotra as early as the 4th century B.C.. The drug was used by Dioscorides, Celsus and Pliny, as well as by the later Greek and Arab physicians, though it is not mentioned by either Hippocrates or Theophrastus. It was one of the drugs recommended to Alfred the Great by the Patriarch of Jerusalem.

A useful paper by A.Leung in Drug and Cosmetic Industry, September 1985 reports that freshly obtained aloe vera gel is well known for its ability to relieve pain due to sunburn or thermal burns, and to promote wound-healing in minor skin irritations, cuts and bruises, however, the active

principle(s) is unstable and only present in small amounts. He then goes on to describe the techniques for extracting and improving the stability of the material.

E.McKeown in *Cosmetics and Toiletries* 102, June 1987 p.64-65 gives us an account of Aloe vera and gives a very detailed breakdown on the components of this material. He goes on to describe the use of aloe as a moisturiser, where the mucilaginous gel acts as a film former and has a pH which is directly compatible with that of the skin. He also states that the natural anthraquinones or anthracenic derivatives absorb UV light within the skin's erythema range. He concludes that aloe vera has had a long history of use as a topical treatment in home remedies for minor skin injuries and for beautification purposes with no apparently harmful effects reported.

I.E.Danhof in *Cosmetics and Toiletries* 102, June 1987, p.62-63 attempts to explain the mechanism for the skin benefits of aloe vera. He supports the theory that small amounts of aloe do penetrate the skin and increase fibroblast activity, which leads to an increased level of collagen. He also reports of the anti-inflammatory properties of aloe.

Leung (B49) reports that aloe is used as a moisturiser, emollient, or wound healer in various cosmetic and pharmaceutical preparations. In folk medicine aloe vera gel is well known for its domestic medicinal value. When freshly obtained the gel has the property of relieving thermal burn and sunburn as well as promoting wound healing. It also has moisturising and emollient properties.

Back in her book (B55) says that the Greeks and Egyptians knew the value of Aloe Vera juice using it in their medicines and cosmetic preparations. It is believed to have been used by Cleopatra to keep her complexion clear and soft. Bitter aloes used to be used to stop nail biting. Aloe Vera has a soothing and healing gel, disinfectant and astringent when used externally.

It helps to keep the skin healthy by stimulating the circulation and promoting the growth of new tissue. The fresh aloe leaves can be split open to provide an instant remedy for minor cuts and burns, insect bites and sunburn. One of the most valuable cosmetic properties of Aloe Vera is its ability to stimulate the circulation of the skin and remove the dead skin cells, so giving a fresher and younger appearance to the skin. It also clears away blemishes, protects the skin against infection and reduces wrinkles. Aloe Vera shampoo helps to combat dry, brittle hair.

Potter in his book (B5) says that it is an emmenagogue, purgative and anthelmintic. It is used in constipation, dyspepsia, menstrual suppressions and piles. Given to nursing mothers it causes purging in the suckling infant. Acts particularly on the lower bowel.

Lust in his book (B8) reports that Aloe vera is an emollient, purgative, vulnerary. Aloes is the dried juice of the aloe plant. It has a nauseating taste. The fresh leaves of the aloe can be split and the gelatinous juice rubbed onto the skin for sunburn and other minor burns, wrinkles, insect bites,

skin irritations and minor cuts and scratches.. The fresh juice is also said to help heal wounds by preventing or drawing out infection. A tea made from the dried juice makes a good wash for wounds and for the eyes.

J.M.Marshall, The Pharmaceutical Journal. 24th March 1990 p360-362. Aloe Vera gel: What is the evidence? There is no BP monograph on Aloe vera gel, the existing monographs refer to "aloes" which is the solidified exudate or sap which drains from the leaves of certain aloe species when they are cut from the plant. This sap is produced in the pericyclic cells and is a bitter sticky juice which solidifies on boiling.

Aloe vera gel is a mucilaginous preparation which is obtained by cutting the leaves open once the sap has been drained away. The use of the Aloe vera gel plant for medicinal purposes stretches back many centuries, being mentioned by the ancient Greeks and Egyptians, Dioscorides and the ancient Anglo-Saxon leech books. Reports of the use of indigenous species of aloe by the peoples of India, Japan, South Africa, China and Mexico include treatment of gastrointestinal, ophthalmological, liver, skin and musculoskeletal disorders, bronchitis, asthma, leprosy, burns, wounds and hair loss.

Recently, interest in the possible curative properties of Aloe vera gel has been growing in Western countries, particularly the USA. Widely recommended as a household remedy for burns and other wounds. There is much promotional literature for its use as benefit or cure for skin disorders such as acne, dermatitis, psoriasis, eczema and hair loss, arthritis, rheumatism, peptic ulcer and indigestion.

1930 use of Aloe vera gel in the management of radiation burns. Initially used to soothe the burns, the gel promoted healing and re-epithelialisation, making surgery unnecessary.

1940 workers at the US Atomic Energy Commission found that it speeded the sloughing of necrotic tissue and promoted re-epithelialisation.

1950 treatment of rats, rabbits and humans showed no benefits from the gel.

1982 it was reported that a cream preparation increased dermal perfusion and decreased thromboxane levels in guinea pigs burn wounds and that it enhanced tissue survival in frostbite injuries in rabbits.

1988 A report on the study of guinea pigs reported a reduced healing time for burn wounds when Aloe vera gel was used, compared to the use of silver sulphadiazine cream or dry gauze.

Case reports of management of leg ulcers with Aloe vera gel in three patients mentioned initial lysis of necrotic tissue followed by an improved vascularisation of the ulcer area and some

re-epithelialisation. The same authors reported the use of the gel in three cases of acne vulgaris, three cases of seborrhoeic alopecia and three cases of alopecia areata. In the cases of acne vulgaris they reported two cases completely healed and one case much improved, though they did not detail the cleaning regime. In the alopecia there was a reported increase in hair growth. Chemical analysis has led to the identification of a number of substances which may contribute to its suggested dermatological properties. Drying out of the wounds may be prevented by the high water content of the gel (98-99%) or the oils present. It has also been pointed out that the use of the gel may be comparable to modern polysaccharide hydrogel and hydrocolloid dressings. Sugars, a number of which are present in the gel have been used in wound care and are thought to inhibit bacterial growth by exerting a high osmotic pressure.

In vitro studies with the gel have reported inhibition of prostaglandin synthesis and the presence of an enzyme which hydrolyses bradykinin. Both of these properties would reduce pain and inflammation in wounds if they occurred in vivo.

Magnesium lactate has also been isolated in the gel and is reported to inhibit histidine decarboxylase which would reduce histamine release in the inflammation response.

Reported enzymatic degradation of necrotic tissue when Aloe vera gel was applied may be related to the presence of amylase. A substance named aloctin-A has been isolated from the gel and is reported to induce mitosis, although its structure has not yet been elucidated. Aloctin-A may promote healing and stimulate production of macrophages to remove dead tissue.

The gel is also reported to contain salicylic acid which has keratolytic and bacteriostatic properties. It is reported to be active against *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Escherichia coli* and *Klebsiella pneumoniae*. Other studies have found the antibacterial activity to be limited to the sap drained from the leaves.

The paper goes on to discuss arthritis and rheumatism, peptic ulcers etc. The paper concludes that Aloe vera gel is confused with data on the aloe sap, though admits that there is good evidence that Aloe vera gel is a moisturiser and has good possibility of being a wound and burn healer. There are at least 20 references.

In a book by Manniche (B59) we read that Aloe is a succulent plant with clusters of fleshy leaves. The juice contains a volatile oil and aloins which are purgative. It is used nowadays as a soothing and moisturising ingredient in skin care products, and to heal skin inflammations, sores and burns. Because of its purgative effect it is contraindicated for pregnancy and haemorrhoids. The use of aloe can be traced. Prospero Alpini relates that Egyptian women of his day perfumed their private parts with it and that the wood was used in composite remedies to treat fever and plague. Aloe was known to the Greeks, for Alexander is said to have been instructed to conquer the island of Socotra between Somalia and Hadramout where the plants grew. In the Bible the plant was known as ahaloth and it was used as a perfuming agent (e.g. John 19:39-40). The Assyrian Herbal prescribes sibiru for the stomach and difficult breathing. In the ancient Egyptian texts ht-w3 has been

suggested for aloe. One of the plants represented in Egyptian art so frequently that it is nearly stereotyped could be the aloe. It is used to suggest a desert environment, as for example on a painted shrine of Tutankhamun. Only the leaves are shown. The Copts used aloe with other ingredients to treat eye diseases, swellings and digestive disorders. The skin disease called psora was treated with an unguent based on aloe.

In the Extract from Nature book (B47) we read that it is a sub-tropical member of the lily family. Aloe vera is a succulent which contains a richly emollient gel. It has a wide range of nourishing and healing properties, and can be used directly from the plant. Excellent in treating burns and sunburn, it can also be used to smooth wrinkles, soothe bites and in preventing infection.

In a data sheet from Dragoco (product number 2/912800) we read that it was prized in early historical times both as a remedy for all manner of ills and as a means of preserving beauty. Legend has it that the natural juice of the aloe plant was used by Cleopatra and Nefertiti for both skin and hair care. Dioscorides the Greek, doctor and most renowned pharmacologist of antiquity, also praises the efficacy of the aloe in his writings. Alexander the Great is said to have prescribed aloe extract as a miraculous wound salve for his soldiers.

Aloe vera has some common names which include Burn Plant, First Aid plant and Medicine Plant. The Aloe vera plant grows wild in Barbados, Jamaica, Mexico, Puerto Rico, in the southern USA, Central America, in Mediterranean countries, India and other tropical and sub-tropical regions.

The Aloe vera gel is obtained from the inner, colourless, mucilaginous parenchyma (tubular leaf cells) of the aloe vera leaf. It contains amino sugars, amino acids, enzymes, inorganic salts, monosaccharides, mucopolysaccharides, sterols, triterpenoids and vitamins. It protects, soothes and cares for the skin. It has anti-inflammatory effect, has a moisturising effect. It has a regenerative effect and promotes suppleness. It has a beneficial effect on the circulation. It has a bacteriostatic effect, strengthens and cares for the scalp, protects and cares for the hair, prevents hair breaking and splitting.

In a further data sheet it is cited as being a prophylactic for dry skin which is prone to inflammation, because of its antiphlogistic, bacteriostatic and moisturising qualities.

In a data sheet from Exsymol (through Paroxite) we learn that it contains 5-10% water, 1-2% mineral matter, flavonoids, amino acids. Traces of essential oil are found. The most interesting components are polysaccharides (mucosides) as well as free anthraquinones (aloin, aloin, aloin-8-O-glucoside) or glycosyls (aloinosides).

It is hydrating (polysaccharides, mineral ions), healing, bactericide and anti-viral

(anthraquinones).

Buchman (B15) says that it is a cosmetic aid and antburn remedy. The gel will relieve many skin irritations, including sunburn and will also soften rough skin. Recent experiments indicate this same gel is successful in alleviating the pain of rheumatic joints.

All this data leads to the comprehensive agreement that the aloe vera plant (revered since earliest times) has a just reputation as a skin healing agent. It has only been with the facility of modern analysis and enquiry that answers to prove and explain the action has been found.

Conclusion

A few plants have been examined using a limited amount of data, in all cases the ancient beliefs have been proven to have a base in scientific fact.

The choice of plants was picked almost at random, most of the 350 natural materials on record in the author's data base would stand up to similar cross reference and scrutiny.

The future quite obviously lies in the past.

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Appendix I

CHINESE MEDICINAL PLANTS

<u>Common name</u>	<u>Latin name</u>
ALOE VERA	Aloe vera
ANISEED	Pimpinella anisum
ARACHIS,PEANUT	Arachis hypogaea
BARBERRY	Berberis vulgaris
BEESWAX	Cera alba
BLACK CATECHU	Acacia catechu

BURDOCK	Arctium lappa
CAMELLIA	Camellia thea
	Thea sinensis
	Thea viridis
CAMPHOR	Cinnamomum camphora
CARDAMOM	Elettaria cardamomum
CARROT	Daucus carota
CINCHONA BARK	Cinchona succirubra
CINNAMON	Cinnamomum zeylanicum
CYPRESS	Cupresses sempervirens
DANDELION	Taraxacum officinale
EPHEDRA	Ephedra distachya
EVERLASTING	Gnaphalium polycephalu
	Gnaphalium
FENNEL	Foeniculum vulgare
FENUGREEK or METHI	Trigonella foenum-graeceum
FRANKINCENSE	Boswellia thurifera
GARLIC	Allium sativum
GINGER	Zingiber officinale
GINSENG	Panax quinquefolium
HAWTHORN	Crataegus oxyacantha
	Crataegus monogyna
HIBISCUS	Hibiscus abelmoschus
HOLLYCOCK	Althaea rosea
JASMINE	Jasminium officinale
LEMON GRASS	Cymbopogon citratus
LEMON	Citrus limonum
	Citrus medica
LIQUORICE	Glycyrrhiza glabra
LOTUS TREE, JUJUBE,TAISOH	Zizyphus jujuba
	Zizuphus jujuba
LOTUS, WHITE LOTUS	Nymphaea lotus
	Nymphaea odorata
LOVAGE	Legusticum levisticum
	Levisticum officinale
MAGNOLIA	Magnolia glauca
MARJORAM, WINTER	Origanum heracleoticum
MARJORAM, SWEET	Origanum majorana
MULBERRY	Morus nigra
MYRRH	Commiphora molmol
OHGON	Scutellaria baicalensis
OLIVE	Olea europaea
OSMANTHUS	Osmanthus fragrans

Chinese medicinal plants continued.

<u>Common name</u>	<u>Latin name</u>
PEARL	
PEONY	<i>Paeonia officinalis</i>
PLANTAIN	<i>Plantago major</i>
POMEGRANATE	<i>Punica granatum</i>
ROSEMARY	<i>Rosmarinus officinalis</i>
ROYAL JELLY	
SAGE	<i>Salvia officinalis</i>
SANDALWOOD	<i>Santalum album</i>
SCARLET PIMPERNEL	<i>Anagallis arvensis</i>
SEAWEEDSEAKELP	<i>Ascophylum nodosum</i>
SELFHEAL	<i>Prunella vulgaris</i>
SEMBURI	<i>Swertiae Herba</i>
THYME	<i>Thymus vulgaris</i>
VALERIAN	<i>Valeriana officinalis</i>
WHITE WATER LILY	<i>Nymphaea alba major aquatica</i>
YARROW, MILFOIL	<i>Achillea millefolium</i>
YELLOW WATER LILY	<i>Nymphaea lutea</i>

EGYPTIAN MEDICINAL PLANTS

Common name	Latin names
ACACIA,SHIKAKAI	Acacia senegal
	Acacia concinna
ALKANET	Alkanna tinctoria
ALMOND	Prunus dulcis
	Amygdalus communis
ALOE VERA	Aloe vera
ANISEED	Pimpinella anisum
BALANOS	Balanites aegyptiaca
BANANA	Musa paradisiaca
	Musa sapientum
BARBERRY	Berberis vulgaris
BIRTHWORT	Aristolochia clematitis
CALENDULA,MARIGOLD	Calendula officinalis
CAPER,CAPER BUSH	Capparis spinosa
CARDAMOM	Elettaria cardamomum
CARDOON	Cynara cardunculus
CAROB	Ceratonia siliqua
CASTOR	Ricinus communis
CELERY	Apium graveolens
CHERVIL	Anthriscus cerefolium
CHICK-PEA	Cicer arietinum
CHICORY	Cichorium intybus
CINNAMON	Cinnamomum zeylanicum
CLOVE	Syzygium aromaticum
	Eugenia caryophyllata
	Jambosa caryophyllus
CORIANDER	Coriandrum sativum
CORNFLOWER	Centaurea cyanus
CUCUMBER	Cucumis melo
	Cucumis sativus
CUMIN	Cumin cyminum
CYPERUS GRASS	Cyperus esculentus

DILL	Anethum graveolens
FENNEL	Foeniculum vulgare
FENUGREEK or METHI	Trigonella foenum-graeceum
FIR	Abies cilicia
FLAX	Linum usitatissimum
FRANKINCENSE	Boswellia thurifera
GARLIC	Allium sativum
HEMP, CANNABIS	Cannabis sativa
HENNA or MEHENDI	Lawsonia alba
HIBISCUS	Hibiscus abelmoschus
INDIGO, WILDINDIGO	Baptisia tinctoria
	Sophora tinctoria
	Podalyria tinctoria
JUNIPER	Juniperus phoenicea
	Juniperus drupacea
	J.phoenicea
KYPHI	A mixture of materials
LEMON GRASS	Cymbopogon citratus
LETTUCE	Lactuca sativa

(Egyptian plants continued)

Common name	Latin name
LOTUS TREE, JUJUBE, TAISOH	Zizyphus jujuba
	Zizyphus jujuba
LOTUS, WHITE LOTUS	Nymphaea lotus
MARSH MALLOW, MALLOW	Malva sylvestris
	Malva rotundifolia
MANDRAKE	Mandragora officinarum
MARJORAM, SWEET	Origanum majorana
MARJORAM, WINTER	Origanum heracleoticum
MELON	Citrullus lanatus
MORINGA	Moringa pterygosperma
	Moringa aptera
MULBERRY	Morus nigra
MYRTLE	Myrtus communis
OSMANTHUS	Osmanthus fragrans
PARSLEY	Carum petroselinum
	Petroselinum crispum
PERSEA	Mimusops laurifolius
PLANTAIN	Plantago major
POMEGRANATE	Punica granatum

POPPY	Papaver somniferum
ROSEMARY	Rosmarinus officinalis
RUE	Ruta graveolens
SAFFLOWER	Carthamus tinctorius
SANDALWOOD	Santalum album
SCARLET PIMPERNEL	Anagallis arvensis
SESAME	Sesamum indicum
SUNFLOWER	Helianthus annuus
THYME	Thymus vulgaris
WHITE WATER LILY	Nymphaea alba major aquatica
WILLOW	Salix vitellina
YELLOW WATER LILY	Nymphaea lutea

INDIAN MEDICINAL PLANTS

<u>Common name</u>	<u>Latin name</u>
ACACIA,SHIKAKAI	Acacia senegal
	Acacia concinna
ALOE VERA	Aloe vera
AMLA	Emblica officinalis
ARACHIS,PEANUT	Arachis hypogaea
BANANA	Musa paradisiaca
	Musa sapientum
BASIL	Ocimum basilicum
CAMELLIA	Camellia thea
	Thea sinensis
	Thea viridis
	Thea bohea

		Thea stricta		
CARDAMOM		Elettaria cardamomum		
CASTOR		Ricinus communis		
BLACK CATECHU		Acacia catechu		
CHICK-PEA		Cicer arietinum		
CINCHONA BARK		Cinchona succirubra		
COMFREY		Symphytum officinale		
DANDELION		Taraxacum officinale		
EVERLASTING		Gnaphalium polycephalu		
		Gnaphalium arenarium		
		Gnaphalium dioicum		
		Gnaphalium stoeches		
		Gnaphalium citrinum		
		Helichrysum stoeches		
FENNEL		Foeniculum vulgare		
FENUGREEK or METHI		Trigonella foenum-graeceum		
FLAX		Linum usitatissimum		
GINGER		Zingiber officinale		
GOTU KOLA		Centella asiatica		
		Hydrocotyle asiatica		
HENNA or MEHENDI		Lawsonia alba		
HIBISCUS		Hibiscus abelmoschus		
JASMINE		Jasminium officinale		
LEMON		Citrus limonum		
		Citrus medica		
LEMON GRASS		Cymbopogon citratus		
LOTUS, WHITE LOTUS		Nymphaea lotus		
MANGO		Mangifera indica		
NUTMEG		Myristica fragrans		
PAPAYA or PAW PAW		Carica papaya		
PLANTAIN		Plantagao major		
POMEGRANATE		Punica granatum		
SAFFLOWER		Carthamus tinctorius		
SANDALWOOD		Santalum album		
SARSPARILLA		Smilax ornata		
SESAME		Sesamum indicum		
SISYMBRIUM		Sisymbrium irio		
SUNFLOWER		Helianthus annuus		
WITHANIA		Withania somnifera Dunal		
		W.coagulans Dunal		

